



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,996	10/30/2003	Mark Own Homewood	S1022.81044US00	7394
23628	7590	04/06/2006	EXAMINER	
WOLF GREENFIELD & SACKS, PC				HASSAN, AURANGZEB
FEDERAL RESERVE PLAZA				ART UNIT
600 ATLANTIC AVENUE				PAPER NUMBER
BOSTON, MA 02210-2206				2182

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/697,996	HOMEWOOD ET AL.	

  

<b>Examiner</b>	<b>Art Unit</b>	
Aurangzeb Hassan	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 05 January 2006.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-30 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-30 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 October 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3 – 9, 13 – 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Lewis et al (U.S. Patent No. 5,797,043 hereinafter “Lewis”).
3. As to Claims 1 and 24, Lewis teaches a system comprising:
  - a processor for executing instructions; (Host Processor, element 12, figure 1a)
  - a stream register unit connected to supply data from the peripheral to the processor (I/O Channel Controller, element 62, figure 3, element 140, figure 5a);
  - a FIFO connected to receive data from the peripheral (FIFO Pool Bus, column 14, lines 25 – 29) and connected to the stream register unit by a communication path, along which the said data can be supplied from the FIFO to the stream register unit (FIFO pool subsystem, figure 6); and
  - a memory bus connected between the data memory and the processor, across which the processor can access the randomly accessible data (Processor Bus, element 16', figure 2).

Art Unit: 2182

4. As to claim 3, Lewis teaches a system, wherein data is supplied from the FIFO to the stream register unit accordance with requests for data made (requested function, column 13, 23 – 30) by the processor to the stream register unit and forwarded to the FIFO (FIFO pool buffering functions, column 12, lines 38 –58).

5. As to claim 4, Lewis teaches a system, wherein the said requests are made as accesses to volatile variables (10 Bit – Request variable changes consistently per requested lines of data and can be changed at any time, Table VIII).

6. As to claim 5, Lewis teaches a system wherein the FIFO is arranged to, upon receiving a request for data from the stream register unit, send a signal to the stream register unit indication availability of the requested data (available space and data, Table VII sent via BTU, element 170 figure 5b.).

7. As to claim 6, Lewis teaches a system, wherein if the FIFO contains the requested data, the said signal to the stream register unit indicates that the data is available, and the FIFO is further arranged to send (burst data transfer, column 20, lines 1 – 4) a signal (transfer signals, Table VI) to the stream register unit comprising the data (column 19, lines 64 – 67, column 20, lines 1 – 35).

8. As to claim 7, Lewis teaches a system, wherein the stream register unit is arranged to, following receipt of the signal comprising the data, supply the data (data

stream, element 76, figure 3) to the processor (column 10, lines 25 – 41, passed to DSP, column 20 lines 5 - 35).

9. As to claim 8, Lewis teaches a system, wherein the stream register unit is arranged to, following receipt of the signal comprising the data, send a signal to the FIFO indicating that it has taken the data (Transfer Done, Table VII).

10. As to claim 9, Lewis teaches a system, wherein the said signal to the FIFO further indicates the next location in the FIFO from which the data is required (next sequential, column 16, lines 10 – 33).

11. As to claims 13 and 25, Lewis teaches a system, further comprising a timeout generator, arranged for communication with the processor and the stream register unit, and arranged to, if the signal sent by the FIFO is a different signal indicating that the data is not available(data available in the FIFO, Table VIII), after a predetermined period of time, send a timeout signal to the processor, causing the processor to interrupt (Interrupt, Table III & XXIV) such that it can execute other instructions (column 36, lines 1 – 17).

12. As to claim 14, Lewis teaches a system, wherein if following sending of the timeout signal to the processor the data subsequently becomes available, the timeout generator is arranged to receive a signal instructing it to cease sending the timeout

signal, and to, upon receipt of the said instruction, cease sending the timeout signal (column 36, lines 18 – 40).

13. As to claim 15, Lewis teaches a system, wherein the stream register unit is arranged to, if following sending of the timeout signal to the processor the data subsequently becomes available, send the data to the processor (in response to host interrupts, the host processor provides for the transfer of data, column 26, lines 25 – 34).

14. As to claim 16, Lewis teaches a system, wherein the stream register unit is associated with a register file containing a plurality of registers (register based interface, column 22, lines 15 – 33) and a load/store unit arranged to receive data from the stream register unit and temporarily store the data in the register file (column 19, lines 52 – 63).

15. As to claim 17, Lewis teaches a system, wherein the processor is arranged to retrieve data from the register file (column 22, lines 15 – 33).

16. As to claim 18, Lewis teaches a system, wherein data is supplied from the FIFO to the stream register unit in accordance with requests for data made by the processor to the stream register unit and forwarded to the FIFO (figure 1a and 1b), wherein the stream register unit is associated with a register file containing a plurality of registers and a load/store unit arranged to receive data from the stream register unit and

temporarily store the data in the register file (column 19, lines 52 – 63), wherein the processor is further arranged to make requests for data to the stream register unit via the load/store unit (column 33, lines 33 – 39).

17. As to claim 19, Lewis teaches a system, wherein the stream register unit comprises one or more FIFOs connected to receive data from the FIFO connected to the stream register and supply the data to the processor (FIFO 0 – 3, elements 210 – 212, figure 5c).

18. As to claim 20, Lewis teaches a system, wherein the request for data is a request for a single data item (column 10, lines 30 - 41).

19. As to claim 21, Lewis teaches a system, further comprising one or more additional FIFOs linked (FIFO 0 – 3, elements 210 – 212, figure 5c) together between the said FIFO and the communication channel (FIFO pool subsystem, figure 6).

20. As to claim 22, Lewis teaches a system, wherein the data from the peripheral is video data (video words, column 25, lines 37 – 40).

21. As to claim 23, Lewis teaches a system, wherein the peripheral is a video processing system (video controller, column 25, lines 29 – 48).

***Claim Rejections - 35 USC § 103***

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of George et al. (US Patent Number 6,785,829, hereinafter “George”).

24. As to claim 2, Lewis teaches a system, comprising a processor for executing instructions; and a stream register unit connected to supply data from the peripheral to the processor.

Lewis fails to teach a system wherein the stream register unit forms part of the processor.

George teaches, in an analogous system, a system wherein the stream register unit (cache, element 365, figure 3) forms part of the processor (processor, element 300, figure 3).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Lewis with the above teachings of George. One of ordinary skill in the art at the time of the applicant's invention would have been

motivated to make such modifications in order to efficiently optimize a system with regards to real estate in compactness and means of high-speed processing.

25. Claims 10 thru 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of Lai et al. (US Patent Number 6,433,785 hereinafter "Lai").

26. As to claim 10, Lewis teaches a system comprising a FIFO connected to receive data from the peripheral and connected to the stream register unit.

Lewis fails to teach system wherein the FIFO is further arranged to, if it does not contain the requested data, send a different signal to the stream register unit indicating that the data is not available.

Lai teaches a system, wherein the FIFO is further arranged to, if it does not contain the requested data, send a different signal to the stream register unit indicating that the data is not available (first defer identifier, column 3, lines 16 – 20).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Lewis with the above teachings of Lai. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to make such modifications in order to optimize a request process in which resources are valuable and delays need to be minimized, improving processor to device throughput.

Art Unit: 2182

27. As to claim 11, Lewis teaches a system comprising a FIFO connected to receive data from the peripheral and connected to the stream register unit.

Lewis fails to teach system wherein the stream register unit is arranged to, if the signal sent by the FIFO is the said different signal indicating that the data is not available, send a stall signal to the processor, causing the processor to stop executing instructions.

Lai teaches a system, wherein the stream register unit is arranged to, if the signal sent by the FIFO is the said different signal indicating that the data is not available, send a stall signal to the processor, causing the processor to stop executing instructions (issue a stop signal, column 3, lines 20 - 26).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Lewis with the above teachings of Lai. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to make such modifications in order to handle multiple delayed transactions in a system.

28. As to claim 12, Lewis teaches a system comprising a FIFO connected to receive data from the peripheral and connected to the stream register unit.

Lewis fails to teach system wherein the FIFO is further arranged to, if following sending of the said different signal to the stream register unit indicating that the data is available and to send a signal comprising the data to the stream register unit.

Lai teaches a system, wherein the FIFO is further arranged to, if following sending of the said different signal to the stream register unit indicating that the data is available and to send a signal comprising the data to the stream register unit (when the initiator is ready, data transfer between the initiator and the responder begins, column 3, lines 32 – 34).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Lewis with the above teachings of Lai. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to make such modifications in order to handle multiple delayed transactions in a system requesting data.

29. Claim 26 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of Garcia et al. (US Patent Number 6,433,785 hereinafter "Garcia").

30. As per claims 26 and 30, Lewis teaches a stream register connectable between a processor and peripheral and between a processor and a memory, comprising:

a receiver arranged to receive a request for a data item from the processor (column 10, lines 30 - 41); and

a stream engine (element 76, figure 3), arranged to send the request to the peripheral and receive one or more signals back from the peripheral indicating availability of the requested data item (I/O Channel Controller, element 62, figure 3),

Art Unit: 2182

and, if the data item is available (available space and data, Table VII sent via BTU, element 170 figure 5b.), send the data item to the processor.

Lewis fails to teach a register wherein if the data item being requested is not available, sending a timeout signal to the processor.

Garcia teaches a register wherein if the data item being requested is not available, sending a timeout signal to the processor (timeout counter, column 5, lines 26 – 42)

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Lewis with the above teachings of Garcia. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to make such modifications in order to optimize a request process in which resources are valuable and delays need to be minimized, improving processor to device throughput.

31. As to claim 27, Lewis teaches a stream register, wherein the stream engine is arranged to the interrupt signal to the processor after a predetermined period of time (Interrupt, table III).

32. As to claim 28, Lewis teaches a stream register, wherein the stream engine is further arranged to, if the data is available, temporarily store the data in a register file for access by the processor (temporarily stored in a FIFO within the bus master units, column 19, lines 52 – 63).

33. Lewis modified by the teachings of Garcia as applied to claims 26 and 30 above, in regards to claim 29, Lewis teaches a stream register, wherein the stream engine is further arranged to temporarily store (column 19, lines 52 – 63) the data in a register file for access by the processor (column 18, lines 29 – 36).

Lewis fails to teach a stream register, wherein the stream engine is further arranged to, following sending of the timeout signal to the processor, if the data item subsequently becomes available, receive a signal instructing it to cease sending the timeout signal, and to upon receipt of the said instruction cease sending the timeout signal to the processor.

Garcia teaches a stream register, wherein the stream engine is further arranged to, following sending of the timeout signal to the processor, if the data item subsequently becomes available (posted write buffer available signal 350, column 5, lines 30 – 31), receive a signal instructing it to cease sending the timeout signal, and to upon receipt of the said instruction cease sending the timeout signal to the processor (column 5, lines 26 – 42).

### ***Response to Arguments***

34. Applicant's arguments with respect to claims 1 – 30 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Art Unit: 2182

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aurangzeb Hassan whose telephone number is (571)272-8625. The examiner can normally be reached on Monday - Friday 9 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Huynh can be reached on (571)272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AH

3/16/2006



KIM HUYNH  
SUPERVISORY PATENT EXAMINER  
4/17/06